EINSTEIN TELESCOPE

ET-PP (WP6)
2nd review meeting (RP2)

Horizon Europe: Coordination and Support Actions

15/05/2025

Grant agreement: Nº 101079696

WP 6: Introduction and objectives

- WP6 has been designed as the entry-point in ET-PP to the activities and results of the ET Scientific Collaboration
  - Original Objectives:

Objectives	From the ET-PP GA
Delivering of the technical design of both the research infrastructure and the hosted detectors of ET. Delivering the science case in a global context. Delivering, in collaboration with WP2 and WP8, the Data Management Plan and the Data Access Policy for ET.	

- The evolution of the ET framework impacted on the distribution of the tasks and of the deliverables aiming to achieve these objectives
- The ET Collaboration is (currently) responsible for
  - ET observational science,
  - ET instrumental science (detector) and
  - ET site scientific characterization methodologies
- WP6 is acting within this updated framework

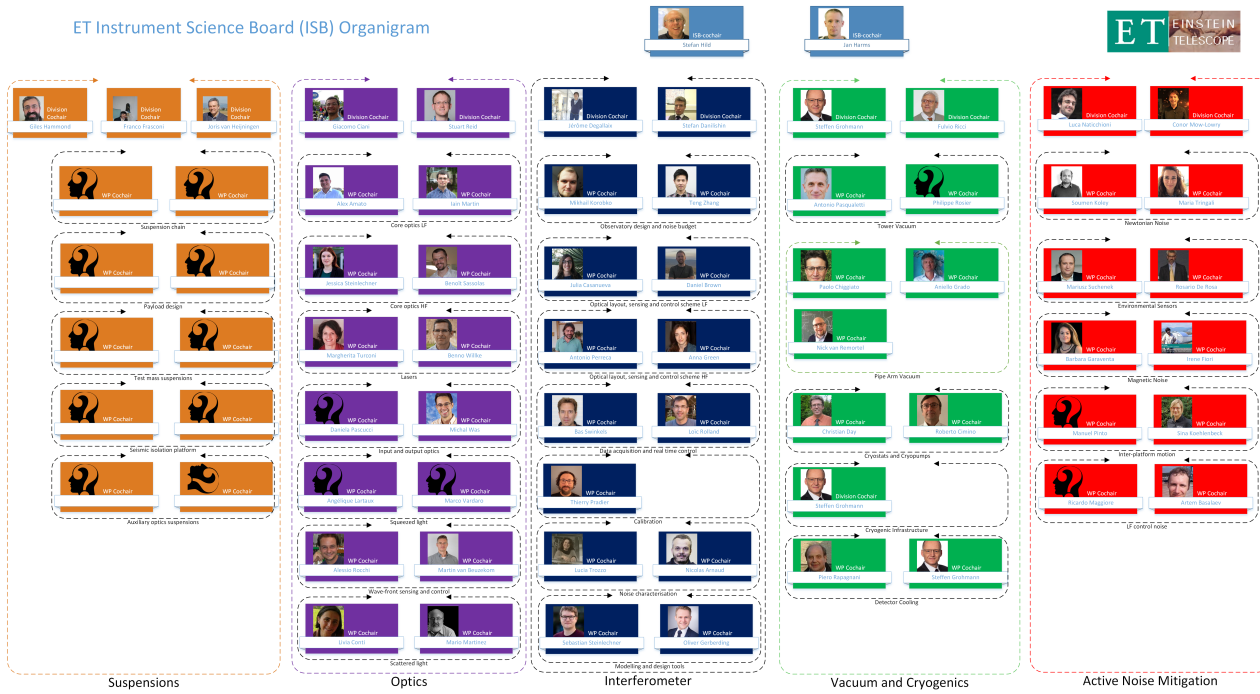
Map of the Institutions of the ET Collaboration
1803 members, in 261 institutions, in 31 countries

WP 6: Tasks

- **ET (refined) science case**
  - The scientific and strategic scenario has matured with respect to the snapshot we had in 2020:
    - Global interest in a 3G network of GW observatories
    - A good number of governments in Europe is **actively** interested to host ET
    - A monumental but incomplete success of the current GW detectors
- Optimization of the ET science return within this new framework
    - First step: A broad understanding of ET's science targets and potential with different geometries: *«Science with the Einstein Telescope: a comparison of different designs»*
      Marica Branchesi et al JCAP07(2023)068, DOI 10.1088/1475-7516/2023/07/068, arXiv:2303.15923 [gr-qc]
      - Identified two geometries as possible implementations of ET:
        Δ-10km, 2L-15km with a clear strength and weakness evaluation
    - Second step: produced a deep and “conclusive” study of ET's science targets in the two identified geometries:
      - The Science of the Einstein Telescope (aka "The BlueBook")
        ET-0036B-25, arXiv:2503.12263 [gr-qc] (delivered)

WP 6: Tasks

- **ET Detector Design**
  - The Instrument Science Board of the Collaboration is devoted to the scientific and technical activities to develop technologies, define the design and prototype the apparatuses for the ET detectors
  - The activity is based on national R&D efforts, regular coordination meetings at the level of division chairs and technical meetings at the level of WPs
  - The detector design is coordinated by the ETO PO, that gives the framework, and ETC ISB that fills the content



WP 6: Tasks

- **ET Data Management Plan (DMP) and Data Access Policy (DAP)**
  - This complex task aims to define the ET policy for data access and the consequent DMP (D6.6, M46)
  - Several actors have to play in synergy to achieve the expected result
    - The scientists have to optimize the data access policy to maximize the science return of ET
    - Agencies have to optimize the usage of public resources
    - The global network of GW observatories and scientific communities to define the scientific framework
    - Technical bodies (EIB and WP8) have to design an efficient DMP for ET
  - At the 2024 ET symposium we introduced the discussion with a wide overview of the policies adopted by large R.I. in Astronomy, Astrophysics and Physics
  - At the next ET Symposium (May 26-30,2025), we will explore the options for ET.
  - A committee will be formed to produce an ET vision on the DMP/DAP

WP 6: Critical risks, deviations from Annex I, contingency plans

- WP6 tasks have been strongly affected both by the evolution of the ET framework and by the debate on the ET configurations
- Tasks (still) under the responsibility of ETC:
  - Science Case: completed and delivered
  - DMP/DAP: still on track
    - Brainstorming activity started by ETC
    - Risk: large number of actors needed to define a full strategy
      - Level of awareness and readiness still quite low with some of the actors
      - Starting positions quite heterogeneous
      - Need to find a balancing between conflicting interests
    - Plan: create a committee to prepare a proposal
  - Detector design: see next slide on deliverables

WP 6: Deliverables and Milestones

- The Deliverables expected since the last review are:
  - Refined Science Case:
    - Status: delivered
    - Content: a scientific paper (submitted to JCAP), 800+ pages, «full» collaboration authorship, a corner-stone for the ET science
  - Detector Preliminary TDR

WP 6: Deliverables and milestones

- **Detector Preliminary TDR:**
- Structure defined and TOC created:
  - Part 1: a refined CDR based on
    - New optical designs:
      - ET Optical Layout Update 2024 (ET-0443A-24)
      - ET-15km-L Optical Layout Update 2024: main document (ET-0695A-24)
    - Preliminary Detector Layout - 10km Triangle (ET-0676A-24)
    - Task Force output (expected end of May)
    - Writing team in preparation
  - Part 2: a “living” TDR based on:
    - Product breakdown Structure (PBS), defined by ETO and filled by ISB,
      - This iterative process completed its second iteration in April 2025
    - Parameters files, containing descriptions and parameter values, uploaded by ISB members, to be filled on 5th of May 2025
    - Online PBS database, storing all the ET detector parameters and descriptions
    - Python code, reading the online database and producing an automatic LaTeX output.

WP 6: Deliverables and milestones

- **Detector Preliminary TDR:**
  - Already delayed from Month 24 (Sept 2024) to “not earlier than July 2025”
  - Considering the complexity of the activity and the delay accumulated in the intermediated steps, it is more realistic to schedule it for the end of 2025

WP 6: Contribution from each partner

WP6 is the link to the collaboration. A very large fraction of the scientists and engineers in ETC are affiliated to institutions that aren't beneficiaries or third parties of ET-PP. For this reason, the table hereafter has an administrative value but is not representing the effective HR investment in the activities

INSTITUTION		PM as per Annex I	PM in the period
IFAE	**CONTRIBUTIVES**	10	3,6
INFN	**CONTRIBUTIVES**	20	4
UW	**CONTRIBUTIVES**	1	0,58
CNRS	**CONTRIBUTIVES**	28	15,27
NIKHEF	**CONTRIBUTIVES**	2,5	4,32
UAntwerpen	**CONTRIBUTIVES**	48	18
Total Person Months	**CONTRIBUTIVES**	**111,5**	**45,77**
Total Person Months	**REQUESTED EC**	**0**	**0**

WP 6: Outlook and perspectives

- WP6-ETC activities focus on the missing deliverables:
  - Detector preliminary TDR
    - Process well defined
    - Human resources still to be fully involved
    - Timeline: further delay expected, but conclusion within 2025 for the first version
  - Data Management Plan & Data Access Policy
    - Activity still at the embryo stage within the ETC
    - Other actors (ETO, global community) to be involved
    - A special committee to be set-up

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